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ABSTRACT OF THE DISCLOSURE

Disclosed is an electrolyte for a lithium secondary battery. The electrolyte includes a non-aqueous solvent and a sulfone based organic compound represented as in the following Formulae (I), (II), or (III), or a mixture thereof:

$$\begin{array}{ccc}
O \\
II \\
R - S - R' \\
II \\
O
\end{array} (I)$$

where R and R' are independently selected from the group consisting of a primary, secondary, or tertiary alkyl group, alkenyl group, and aryl group; and a substituted primary, secondary, or tertiary alkyl group, alkenyl group, and aryl group, and n is from 0 to 3.